

Notice of Allowability*Amtd.
0504
BT/rm*

Application No.

10/642,218

Examiner

Brandi N Thomas

Applicant(s)

CHEN ET AL.

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-- **The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☐ This communication is responsive to ____.
2. ☒ The allowed claim(s) is/are 1-19.
3. ☒ The drawings filed on 8/18/03 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).
- * Certified copies not received: ____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date ____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date ____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO-1449 or PTO/SB/08), Paper No./Mail Date ____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☒ Interview Summary (PTO-413), Paper No./Mail Date 5/27/04.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other ____



**RICKY MACK
PRIMARY EXAMINER**

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Bruce Troxell on May 27, 2004.

The application has been amended as follows:

Claims

1. An optical switch comprising: a reflective mirror shutter connected to a shutter beam and buckle beam springs; a set of suspended buckle beam springs connected to said movable shutter beam and with two ends anchored onto a substrate; and, a shutter beam connected to at least one moveable translation link and which is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this shutter beam; characterized in that, said V-beam actuators consist at least two sets of movable V-beams suspended on the substrate with two ends anchored onto said substrate, and connected to a link beam structure for pushing and pulling the movement translation link, thereby said shutter beam is moved by said V-beam actuators; said optical switch ~~it~~ also comprises fiber optics for handling the input and output optical signals.

4. An optical switch comprising: a reflective mirror shutter connected to a shutter beam and buckle beam springs; two sets of suspended buckle beam springs connected to said movable shutter beam on both sides of the shutter beam and with two ends anchored onto a substrate;

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wherein the reflective mirror shutter is arranged on the shutter beam located between the two sets of connection points of said suspended buckle beam springs to shutter beam; a shutter beam connected to two moveable translation links at its ends and is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this said shutter beam; characterized in that, two sets of movable V-beams are suspended on the substrate with two ends anchored onto said substrate and located at both sides of shutter beam, and each sets of V-beam connected to a link beam structure for pushing the movement translation link toward the direction along with the arched-direction regarding the relative V-beam, thereby said shutter beam is moved by said V-beam actuators; said optical switch ~~it~~ also comprises fiber optics for handling input and output optical signal.

9. An optical switch comprising: a reflective mirror shutter connected to a shutter beam and buckle beam springs; two sets of suspended buckle beam springs connected to said movable shutter beam and with two ends anchored onto a substrate, where the reflective mirror shutter is arranged on one end of the shutter beam; and a shutter beam connected to a moveable translation link at its end and which is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this shutter beam; characterized in that, two sets of movable V-beams are suspended on the substrate with two ends anchored onto said substrate and located at both sides of shutter beam, and each sets of V-beam is connected to a link beam structure for pushing and pulling the movement translation link move along with the arched-direction regarding the relative V-beam sets, thereby said shutter beam is moved by said V-beam actuators; said optical switch ~~it~~ also comprises fiber optics for handling the input and output optical signals.

13. An optical switch comprising: a reflective mirror shutter connected to a shutter beam and buckle beam springs; two sets of suspended buckle beam springs connected to said movable shutter beam and with two ends anchored onto a substrate; wherein the reflective mirror shutter is arranged on one end of the shutter beam; a shutter beam collected to a moveable translation link at its end and is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this said shutter beam; characterized in that, two sets of movable V-beams are suspended on the substrate with two ends anchored onto said substrate and located at one side of shutter beam, and each sets of V-beam connected to each other via a link beam structure for pushing and pulling the moveable translation link moving along with the arched-direction regarding the relative V-beam sets, thereby said shutter beam is moved by said V-beam actuators; said optical switch ~~it~~ also comprises fiber optics for handling the input and output optical signal.

14. The optical switch as claimed in claim 13, wherein a moveable translation mechanism of said optical switch comprises a moveable translation link structure at one end of said shutter beam, and the movement is provided by one set of said two V-beam actuator sets via link beam; said moveable translation link and a link beam form a spatial joint, thereby one set of V-beam actuators push the shutter beam with buckle beam springs to move from one initial stable position to the second stable position in terms of moveable translation mechanism; furthermore, the other set of V-beam actuators pull the shutter beam with buckle beam springs to move from the second stable position back to the initial stable position in terms of moveable translation mechanism, then the bi-stable switching function of optical switch is achieved; in addition, the V-beam actuators of the optical switch comprises two sets of V-beam actuators is connected to

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each other via a link beam and is located at one side of the shutter beam, and each V- beam actuator set has opposite arched-direction ~~[.]~~ wherein the ~~The~~ forward moving displacement generated by one set of the two sets of V-beam actuators produces push and pull actions to the moveable translation link via said link beam to enable the shutter beam and reflective mirror shutter move from one stable position to the another stable position.

Reasons for Allowance

2. The following is an examiner's statement of reasons for allowance: The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claim(s), in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in claim(s) 1-19, wherein the claimed invention comprises a shutter beam connected to at least one moveable translation link and which is movable with respect to the stationary portion of said substrate in response to the operation of V-beam actuators, thereby said reflective mirror shutter is moved by this shutter beam and said V-beam actuators consist at least two sets of movable V-beams suspended on the substrate with two ends anchored onto said substrate, and connected to a link beam structure for pushing and pulling the movement translation link, thereby said shutter beam is moved by said V-beam actuators, as claimed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brandi N Thomas whose telephone number is 571-272-2341.

The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Epps can be reached on 571-272-2328. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BNT
May 28, 2004


RICKY MACK
PRIMARY EXAMINER